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132 There are further local variations. Thundershowers often occur over a limited area. This precipitation is described by Okinawans as katabui, by which they mean a scattered, here-and-there rainfall.

[131] [917] These variations in rainfall throughout the year and from year to year are the source of complaints of drought, frequently heard in the summer growing and fall harvesting season from July to October. Dr. Green of Commodore Perry's staff mentions that droughts were spoken of in an official Loochoo document.

[134] [133] There is also hidden drought caused by the rapid runoff of water and the absorption of water by permeable soils and quick subterranean drainage. Water for crop growth is thus immediately dependent upon rainfall which must be immediately used before it becomes inaccessible. There are no snowy mountains to store the water for gradual use.

Since it is in a zone of mixture of warm and cold air, Okinawa is cloudy a great deal of the year. The days with the highest percentage of sunshine occur from June to October. There is very little condensation near the surface and fog is uncommon.

Relative humidity is high throughout the year. On the average, it does not fall below 74% (in December), and the highest average is 85% in June. This condition produces a hot humid summer, often with overcast skies and it also brings about a felt or sensible temperature much colder in winter than the temperature would indicate. Okinawan winters may be cold, especially with the winds from the northeast and east northeast. Blankets and heavy clothing do not hold the bodily heat. The insulating value of clothing and blankets seems to be reduced.

Okinawa is also affected by monsoonal influences in southern Asia. In the summer, the basic factor is the heating of large masses of continental air, the creation of low pressure areas, and the transport of air from the ocean to the continent. Prevailing winds are from the east, south, or south south east, or east south east, but here the prevailing should be stressed. Actually in a given period winds may shift and flow from varying directions.

In the winter, it is the air over the ocean that is warmer and the dry air from the cold high pressure areas blows out over the island. Prevailing winds from October through January are from the northeast. Though the mean velocities are modest, strong winds are recorded for every month in the year, winds either from the continent, or typhoons originating in the oceans north of the equator.

132 133 Another modifying factor is the Japanese current (Kuroshio). This current is really part of the North Equatorial current thought to have its origin on the Pacific side of Central America. As the current crosses the Pacific, it gets added colder water from the California current, and is further mixed with tropical and north Pacific waters, and later with western North Pacific waters. The North Equatorial current divides east of the Philippines, its northern arm going along the east side of the

northern Philippines and Formosa. From Formosa, these warm waters continue northeast between the Ryukyus and the shallow parts of the China Sea. In August the current flows on both sides of the islands. The behavior of the Japanese current in this area is strikingly similar to that of the Florida current of the Gulf Stream.[6] 132 133

The Ryukyus are in one of the great typhoon areas of the world. The season is from May to October, times of low atmospheric pressure, when the average range is from 1007 to 1015 millibars compared with a November-April range of 1015 to 1021 millibars. The period usually described as the typhoon season actually represents minimum expectations, for, as the table shows, typhoons have occurred in every month of the year, with the lowest incidence in April. The range from a minimum of twelve to a maximum of forty-five shows the reasons for uncertainties and the uneasiness with which the weather is regarded in the islands. The period of most frequent typhoon incidence coincides with the growing season, and violent typhoons can be expected as a matter of course prior to the winter rice harvest. 132 [731]

In typhoons, heavy winds, and gales, damage from salt water spray, especially in cultivated strips along the coast, can be expected. Local topography has a determining influence on the direction and area of spray damage, but some farmers in the Nagamo area estimated that spray damage had extended inland in some cases for two miles. There is also the problem of the saline content of rainwater. 132 133 [311]

Okinawa has a marine climate modified from what one might expect of its latitude by the monsoon regime which affects southeast Asia. When we understand this, the nature of the rainfall and its distribution, the possibility of drought, and of typhoons and their destructiveness, we are are in a better position to appreciate the difficulties under which agriculture must be practiced. 132

6 Sverdrup, Johnson, and Fleming, The Oceans, 718-22 and the literature there cited. Wust has pointed out in detail the similarities between the two currents. One difference is that the salinity of the Kuroshio is less and its waters are subject to excessive cooling in winter by the cold winds from the continent. See also Nuttonson, as cited, 20.

133 Hanashiro and Gushichan villages to a broad semi-circular valley, the
361 Gushichan plain, with a gentle gradient sloping to the sea. Shortly before the coast is reached there is a sharper drop, and it is in this depression along the shore and the coastal strip that the fishing village lies.

134 The Okinawan clay loams and the Chinen stony clays are also the
133 predominating soils of the area. There are about 85 acres of the gently sloping clay loams, 155 acres of the gently sloping Chinen stony clays. While moderately fertile and well drained, these soils are also shallow and stony, with obvious defects for the pursuit of agriculture. There are 10 acres of deep, fertile poorly drained, slightly acid alluvial soils. These occur along the river and its estuary and in a small former river mouth to the south. There are about six acres in rough stony land.

731 The village has very little storm protection. There are no shelter
133 belts around it, nor are there many trees within. It is open to storms
417 and typhoons, and the water, lashed by the sea, is sufficient to break and scatter the large stones of the seawall. At present, inside the village there is none of the privacy typical of the agricultural villages
361 and their compounds. There are few trees, shrubs, or fences. In the
351 older part of the village, the houses are closely set together. Fishing
227 nets hang on the lines of the yard. In season, the yard is covered with drying fish, fish fins, and fish backs. The yards and the shore are dotted with men cleaning or repairing their boats.

362 The lack of natural beauty of the place is accentuated by the poor-
512 ness of the houses and the other buildings. Its atmosphere is unmistakably
484 different. The village is more commercial and more lively than the quiet and concealed agricultural village. Life is not so much of a routine, for much depends on the weather and the sea. The village has people who have travelled widely. Some of its fishermen have been in the waters of Java, of the South Seas, of the Andaman Islands, the Philippines, and Indo-China.

438 The village's main commercial contacts are with the remaining
[311] agricultural villages of the township from which it must obtain much of its food, for the area is not suited to agriculture, nor is much land available. For wider contacts, there are Itoman about 4 1/2 miles, and Naha about 8 1/2 miles away. Buses go through the village twice a day.
494 The three wheeled cycles are irregular but come and go more often. Fish
368 is sold at Naha. The theatre for the travelling troupe of actors from
574 Naha and for movies is in Horikawa across the river. Many visits are also made to Itoman to see relatives and friends.

727 The war was even more catastrophic for Minatogawa than for Hanashiro.
[361] Before the war, Minatogawa was a thriving, prosperous and well built up small town. About 70% of its buildings had a tile roof and 30% had thatch roofs. There were about 30 stores, sake shops and drinking places, including a geisha house, along the road, serving the fishermen and the stonecutters. Of the 430 buildings in the area, only three were left

combined with the destructiveness of typhoons, make for an unproductive life in terms of rewards for work done. To these, there is now being added a fourth realisation, that there are too many people in Okinawa. Greater mobility has increased this awareness.[8]

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8 These remarks, too, are based on impressions. Neither would I claim that they represent a majority opinion. Polls with samples competently chosen could only determine these attitudes. But complaints about the poorness of the land are proverbial among Okinawans. So are the discouragements coming from the typhoons.

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In this illustration, the first son receives slightly over 60% of the land, ignoring type and grade within type. There was general agreement [242] in all villages that the grade of land within each classification (grades [651] 1 to 4 in dry crop land, for example) had little significance in inheritance matters. The grade is more important for tax purposes.

The example also illustrates two other principles: the natural desire to keep contiguous or close in land within the main family, using inconvenient or far off land where possible for house sites for branch families, or for arable land for second and other sons. In this illustration, the shares of the second and of the third sons could be equalized by subdividing plot #6, although its small area would not make [241] it worth while, as 75 tsubo is a very low average size for dry crop land.

Another practice, noted in Hanashiro and in Matsuda, is that the first son receives everything on the retirement of the father. This may be contrasted with a situation in which the father divides the property before younger sons marry and establish branch families. In such cases, the father might take the income from part of the property. But the more general practice is for the father to give all to the first son. Fathers may also make a will. When the first son receives all, it is the custom for him to hold property which the younger sons will need in establishing their branch families. It is in cases where the first son is given full disposition of the property that quarrels [593] are most likely to occur, for much depends on the generosity and sense of fairness of the elder brother.[3]

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In Hanashiro and Hinatogawa, it is important that younger brothers receive genya land. Genya is often translated as wild land. In Japan the term is usually used to describe treeless, waste, hilly, rocky, or rolling land unsuitable for cultivation. In Okinawa, the genya land may be in the center of a rice field; it may be a rocky mound with cultivation around it. It may be land in the mountains. It is almost invariably in grass (miscanthus) with an occasional cycad or scrub pine. [137] It is not owned in large tracts. In Hanashiro, the largest single parcel [423] is 4564 tsubo (3.77 acres), in Hinatogawa 1333 (tsubo) (1.9 acres), and in Matsuda 6398 tsubo (5.28 acres), but these are far above the average. In Hanashiro it is important because grass is constantly needed for [824] thatched roofs and other uses. The importance of genya and its grass was well illustrated in Hinatogawa after the typhoon, Ruth, of October [731] 13-14, 1951. These villagers own little land and many have no genya. [432] They were obliged to buy the grass to replace the roofs of many of the frailer houses which had been partially or completely destroyed by the [764] typhoon. Genya is also used for family tombs. In Hanashiro, the genya

[Text continues TOP of P. 133--Analyst]

3) The problem can be appreciated by analyzing the acreage areas of each classification of land and the grades within it, bearing in mind that the average farmer has hatake, genya, and often rice paddies. These statistics will be given in the following chapter.

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place. Then, as now, paddy and dry crop land might lie together, depending upon local factors. In the periodic redistribution, each family received shares of each in non-contiguous fragmented parcels. In the nature of things, they received small shares of the excellent, moderate shares of the good, and large holdings in poor land.

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The old classification of lands was simple and did not go beyond three general divisions of good, fair, and poor. Apparently the Japanese after 1879 introduced more refinements and increased the number of classifications to six. Land classification, then as now, was empirical. It was based on observation, local knowledge of present and past yields, and known dangers to the land. It was not based on scientific knowledge of the soils, nor is it today. [242]

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Several dangers to land and crops were considered: (1) the danger of the wild boar (inoshishi). These reddish brown wild boars have disappeared from large parts of Okinawa, though occasionally one is seen in the northern forest. The boars destroyed crops by night feeding. Remnants of old fences can still be seen in the area around Matsuda. In Oku, in the extreme north, fences are still used and many can be seen along the hillsides. (2) Dangers from floods and salt water spray. Local flooding is common and often confined to a narrow area. Salt water spray and salt water in the air, especially in typhoon times, are still menaces to crops. The danger from typhoons did not enter directly into the determination of land classification because the area of destruction was so wide that it was not a factor distinguishing one plot from another. (One can however observe areas of differential damage in a village as an aftermath of typhoons). [173]

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This old land allotment system is now forgotten except in a few isolated areas where its main features are still apparently preserved. The best known of these is Kudaka Island off the southeastern shore of Okinawa. If the system has disappeared, except for a few isolated survivals, its influence remains to the present: it determined the pattern of land use still in effect today, the pattern of small, discontinuous parcels, and set the precedents for the mechanics of land classification. The basic classifications such as rice land, dry crop land, community forest were Japanese and are of great age. The old land allotment system is also considered to be of great antiquity.[2] [177]

2 It was a matter of considerable disappointment that I was unable to spend two or three weeks on Kudaka to study the land system there. Neither has time permitted an investigation (of great inherent interest) of the historical antecedants of the old Okinawan system. Land classification, such as we will be discussing in the next chapter, is very old in Japanese culture. The old Okinawan system bears some resemblances to the "mouth-share-land" (ku-bu-den) system of old Japan which appears in the Taihō code (702 A.D.). This was a system of distribution of communally owned land, but I have not been able to determine whether the distribution was periodic. See Wigmore, J. H. and Simmons, D. B. Notes on land tenure and local institutions in old Japan. Transactions of the Asiatic Society of Japan, 19 (1891), 77 on land classification, (continued on next page)

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3

Care and Conservation of Land

One of the significant tasks of our time is the study of the relation between population growth and density and the exploitation of renewable and non-renewable resources: the effects of a culture on the land, the forests, the soils and the vegetation must be considered in ethnographic and geographic work. If this is not done the culture is studied as if it rested, like a plate on a table, on a geographic base, without bothering to discover the nature of the environment or what the culture is doing to it.

Nineteenth century studies of primitive and advanced societies emphasized the influence of the physical environment in molding a culture. This crude fallacy, often known as geographic determinism or environmentalism, was exploded by studies made of cultures in all parts of the world in which it became clear that the physical environment is not the cause of cultural differences.

But the reverse of this approach, the examination of what a culture is doing to its physical environment, its soils, its vegetation, and its forests has not been carried on with the vigor with which other aspects of culture have been studied. This point of view has practical significance in day to day administration. Economic matters such as foreign trade or the labor force requirement should not be a separate and independent segment for study. Changes in inheritance should not be viewed solely with reference to the family system. Forest conservation should not be regarded only as a technique and a necessary department in the government.

The effects of the devastating typhoons, for example, need no elaboration: the destruction of life, crops, houses, of boats, and breakwaters. But their effects are also influenced by other factors. The two southern villages were in the midst of some of the violent fighting of the Okinawan campaign. Large numbers of houses in both communities were destroyed by the war. The new buildings to replace them are so frail that in typhoon times they are often destroyed. This rebuilding requires more wood and more grass. Thus, such factors as the war, the inability to reconstruct permanent housing, typhoons, and the natural growing of miscanthus grass are joined together in a close relationship.

In the south the relationship of typhoon destruction to deforestation is striking. There is need for tidebreak groves and shelter belts along the coast to protect crops from wind and salt-water spray, a need which fortunately the Ryukyuan Forest Agency is attempting to meet. Deforestation in the south seems inescapably tied up with long occupance. The center of population has always been in the southern part of the island. Not only should there be trees, but they should be planted in the right places. The deforestation of

the deforestation of
the south over a period of centuries thus is related to water spray and wind damage, relationships which a wise administration cannot neglect.

The natural tendency is to think in terms of population and land and of the food which it can produce. But if the population is envisaged in terms of forest, the land, both cultivated and uncultivated, and the role of the uncultivated land in protecting the soil, broader understandings are possible.[9]

It is a significant fact, to use another example, that goats are tethered and not allowed to graze. They do not roam the hillsides, nor crop off the shoots of young plants. If they did, it is possible that legislation controlling the goat might have to be enacted such as has been done in the island of Cyprus.

It is important therefore, to ascertain how a culture makes use of its natural environment and also how it takes care of it. Typhoons cannot be controlled. Neither can periods of drought which often produce water shortages, prevent the planting of sweet potatoes, or the harvesting of a good rice crop. In areas where control is possible, the Okinawans have developed conservation measures. Almost one hundred years ago, Dr. D. S. Green, Fleet Surgeon attached to the frigate Mississippi on Perry's expedition to Japan, wrote:

> "Two objects seem to influence the islanders in all their operations, viz: the retention of water or moisture, and the avoidance of surface-washing. To effect these desirable ends, especially in a rolling country, a great quantity of grading is required, besides very deep culture; and here both of these have been done."[10]

In the areas studied, no serious sheet erosion was observed.

[Text continues TOP of P. 157 -- Analyst]

9 The general ideas and points of view expressed by Edward Graham in his Natural principles of land use, London, New York, and Toronto, 1944, are pertinent here.

10 Hawks, Perry's expedition to Japan, as cited, II, 26-27. The emphasis is in the original. Green continues with further details of grading around streams, along ravines, and on the uplands. His description today would still fit many parts of Okinawa. He was particularly impressed with the lands on a journey between Nugah (i.e., Nago) and Tanegah, southwest of Unten. His whole passage is well worth reading.

Two other forms of land conservation and maintenance, crop rotation and fertilizers, will be discussed under agriculture.

423 241 business. Fragmentation means inconvenience, loss of time and effort in the simultaneous cultivation of different fields. The situation is the same for the well-to-do and the poor alike. Large holdings do not mean single pieces of land within a large area, but many small parcels of land, of different classification and grade, scattered like those of a less prosperous farmer. There are offsetting advantages. The greatest of these is that crop destruction through typhoons, salt spray, or flooding may be less catastrophic to the individual owner with small scattered holdings than if a family has a single large plot of land.

423 425 Another effect of fragmentation is that it makes a particular plot of land difficult to sell. If one has a small plot of land, an island in a sea of other ownership, the prospective buyer is in the same position as the seller, unless the buyer owns contiguous land and has the money to make the purchase.

423 The natural question at this point is: what are the possibilities of consolidation of ownership in the interests of more efficient and convenient agriculture? The general answer, I believe, is that fragmentation is almost inevitable, consolidation only possible.

In both of the agricultural villages studied, some voluntary consolidation (kokanbungo) has taken place, but it is not of major proportions. It occurs chiefly for two reasons: (1) clustering one's land near the house site, or having two or more parcels of contiguous land is universally desired. Going to and fro is considered troublesome and onerous. (2) When branch families are established, farmers wish to exchange a distant plot for one in the village for a house site. This is often difficult to do, for such an exchange must be mutually advantageous to bring about a transfer.

423 731 Typhoons are a major obstacle to voluntary consolidation into large holdings. It is perhaps possible to exaggerate this, but personal experience and conversation with villagers who have lost the entire crop of one parcel but have salvaged part of the crop of another convince me of its force. A typhoon damages a whole area but the scattered holdings provide the chance that something might be saved. The total damage is the same in any event regardless of ownership. It is the distribution of loss that varies. If in the future, land consolidation were attempted on a broad scale, either by voluntary individual effort, or cooperatively, crop insurance or some form of sharing losses would seem to be necessary.

423 311 407 The present system of land ownership and of land use and the fragmentation of land would seem to preclude any extensive mechanization of agriculture. Even with consolidated holdings, the nature of the landscape might make the effort uneconomical, though this is a question for technicians in these fields.

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Some young farmers are now breaking away from the traditional lunar month and using the western calendar in describing their annual activities.[1]

The use of the lunar month is not confined to farmers. Fishermen, describing their work year, speak in terms of lunar months. For this reason, it is essential in talking to farmers or fishermen to establish at the outset what reckoning they are using. The names of the lunar month and the western month are identical. Following the Chinese, there are no distinctive names for the months. They are numbered from one to twelve. The months have to be distinguished by saying, for example, "sixth month, old calendar," or sixth month, Western calendar."

An interesting minor detail of agriculture and the timekeeping connected with it is the reliance of Okinawan farmers on Japanese almanacs. These are printed and may be purchased throughout the island. One of these printed almanacs is in almost every house, or is readily available from a neighbor. Often, if one asks what is planted or harvested in any particular month, the farmer reaches for his almanac and produces the desired information. If the inquirer is not careful, he will obtain not what a farmer does during the year but what the almanac says he does.

2

Methods and Tools

In the chapter on general geography, it was pointed out that, despite a high annual rainfall and precipitation every month of the year, there is a problem of water shortage and of drought. This is especially serious in the summer months in all three communities.

[Text Continues Top of P. 167--Analyst]

1 The 24 seasons, borrowed from the 24 Chinese solar terms, into which the lunar year is divided, are also retained on the modern calendar, largely for the use of farmers. For example, Shōkan (Little Cold) begins about Jan 6, Chūkei (Insects Awaken) on March 6, Bōshu (Grain in Ear) on June 5, Ritto (Beginning of winter) on Nov. 7. These 24 seasons, in my experience, are not used much. Farmers think more in terms of the four seasons instead of the 24 little seasons. In Okinawa, they must be revised mentally to suit the humid subtropical climate. "Light snow," and "Heavy snow" are inapplicable in Okinawa; they would simply be small seasons in which one would expect the greatest severity of winter. For a list of the small seasons with Chinese characters, see The five thousand character dictionary, 5th ed., with additions and revisions by George D. Wilder and Chien Hsien Tseng. Peking, 1940, xxxi.

132 March through June is the season of greatest rainfall and therefore
731 of greatest flood danger. September and October rain is often light, and it is during this period that there is the greatest likelihood that the sweet potatoes will dry up. During the rainy season, there is flood damage to the rice and dry crop fields, especially if they are in the narrow ravines, or along small stream beds.

132 In Hanashiro, dependence on rainfall is immediate and direct.
312 There is no way of storing water in the mountains by accumulations
241 of snow. Runoff from the hills into the small streams is rapid. Short periods without rain are serious. The planting of the sweet potato is very sensitive to this factor. If one asks a farmer when he plants sweet potatoes, he always qualifies his reply by beginning, "If there is enough rain..."

241 There is in these villages no complex irrigation (kangai). In
312 Hanashiro, the flow of water through rice fields and its division are controlled by simple means. Water comes from the nearby hills, either in rivulets or in slightly wider ditches. In the former case, the water is divided by allowing the owner on one side of the stream to get water one day, diverting it on the next to the other side. The larger streams may be forked.

[133] Streams soon lose their identity as they descend from the hills to the lowlands, where they become the water of the paddy. The streams of Okinawa are hidden in the rice fields.

241 In Matsuda, the flow of water down the hillsides is controlled
311 largely by bench cultivation. Rice paddies go far up the narrow valleys
312 and ravines. When these have been converted to rice fields, the water flows into the highest level. A small aperture on the opposite side allows it to fall into the next lower paddy until the water reaches the level of the valley or lowland, where it may be further dispersed throughout rice fields, or trickle off again as a stream. In this way, the flow of the water, not too fast, not too sluggish, provides continually fresh water with its nutrients from the hillsides for each field, and makes possible the irrigation of large areas.

It is for these reasons that terracing is practiced. Cultivation is easier. So is irrigation. Soil runoff is avoided. Terracing is the only way that a ravine or a small slope can be used for paddies, for which a flat and level piece of land is required. Otherwise, the water necessary for the plant runs off.

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Rice may also be polished by the use of rude wooden mallets. These have a handle about 3 feet long and a head about 1 1/2 feet long. Rice is placed in a mortar with straw on top. It is pounded, often by two or three women swinging alternately. After the hulls are removed, the rice is winnowed, and put back in the mortar until a rough polish is secured. [412]

824
Uses of rice. Every part of the rice plant has a use. The stubble, left in the ground, becomes a part of next season's fertiliser. The chaff and waste dust (nuka) is saved for pigs, cows, and other domestic animals. The hulls often are used for fertiliser, before or after burning. Rice straw has a variety of uses. The most frequent and important of these is for making rope.

After threshing, the straw is dried two or three days. Three or four stalks of about the same length are taken and rolled between the palms. The lower palm, usually the left, is open and up. The right palm rolls the straw into a twist. As the rope grows, new stalks are inserted one at a time, and, when needed, a new length of straw is added. This is not a strong rope, but it has a variety of uses, such as tying down the grass thatch to the roof poles, children's swings, and clothes lines. Mats and pads shaped like a life saver and used to set the sugar pots on after the sugar has been boiled, are made out of rice straw. Another use is in the making of the Ōda (Okinawan). This is a mesh about one foot wide and two feet long. There are loops on each corner. The end of a pole may be inserted in these loops when gathered together. The pole is carried over the shoulder, and sweet potatoes, straw, or other articles may be easily transported. Simple brooms without a handle, little more than a bunch of straw tied together in three places are also made of rice straw. Twisting and braiding rice straw is likely to be rainy day work. These articles are most often made twice in the year, corresponding with the harvests. [283] [285] [482] [417]

At typhoon times, if rice is not completely destroyed, the damaged rice may be used for pig food. The preparation of this rice is women's work. The rice is put in a mortar and pounded with a mallet in the manner already described, although a single operator usually does the work. [731] [231] [462]

243
Types and preferences. As a general rule, the selection of varieties of rice for planting depends on taste, the nature of the soils, and individual judgment of the expected yield of each type. In Matsuda, it is estimated that about one half of the rice is the Formosan variety, Taichu 65 (Taichu rokujugo), in Okinawa known as horai. Another variety, Kunigami #1 (Kunigami ichigo) represents about one-fourth of the crop. Mochigome (akaho) takes up about another one-fourth. This glutinous rice has a brown reddish rust colored kernel and is used for rice cakes. A fourth variety, horai-mochimai, is also well liked. No black rice is grown here. [262]

244 [132] months. The amount of sweet potatoes grown is not closely related to the season. It depends much more on rainfall.

[031] [131] The effects of typhoons on the plant are most noticeable after transplanting. Salt water spray shrivels the transplants up and they die without developing. These conditions are more noticeable near the seashore in areas like Nagamo that lack trees and tidewater shelters.

824 Like rice, all of the sweet potato plant is used. Plant residues are turned under to fertilize the soil. This turning under of the vines or their use in composts is a doubtful blessing if the plants are diseased. The good potatoes are reserved for human consumption. [231] The poor or the diseased ones are mashed up in a stone mortar with a long pole, used like a pestle, for pig and goat food. Besides using the tops as slips, women constantly cut them off for fresh greens for [262] the pigs. The sweet potato is the basic food because it is cheap, can be grown the year round in lowlands and uplands, and can be cultivated by all members of the family. As pig food, it is a means of inexpensively raising animals which later have cash value. The [962] feeding and care of pigs is usually one of the incidental chores of women.

249 184 The varieties most commonly found in these Okinawan villages are the Okinawan #100 (Okinawan no hyakugo) and varieties known locally as the bentō, a small round tuber, and the bokuto. The two chief differences between the northern and southern villages in cultivating the sweet potato are (1) the two and three pronged hoes are much more in evidence in the north. With practice, they can be used advantageously in quickly weeding a plot while not cutting the potato itself. (2) Matsuda appears to be less dependent on the [262] sweet potato as a human food. The farmer here has more rice for him- [231] self and a greater proportion of his sweet potato crop goes for animal food.

6

The Planting of Sugar Cane and Sugar Making

249 Sugar cane (kibi) is grown on dry crop land, its rows often alternating on the same plot with the sweet potato. Cane may be started with cuttings, or it may be a second growth (ratoon) from the stubs of the old plant after it has been cut down for crushing. Cuttings may be purchased or selected plants from another planting are used. The slips are cut to leave three buds. These cuttings may be planted in three ways: (1) all horizontally, (2) horizontally with the cutting which comes from the topmost part of the stalk planted slantwise, or (3) all cuttings may be planted slanting.

The soil must be thoroughly worked with the ever present hoe. Plowing and harrowing are rarely done. The earth must be thoroughly fertilized. In addition, small amounts of compost may be placed under the cutting, and less often liquid night soil might be used.

824 The most common of the Hanashiro trees are (1) the banyan or gajimaru, or yōsu. This tree is a common sight with its long roots growing around and through the stone fences. The tree with its roots bracing the stone fences is excellent typhoon protection for the village. (2) The usuku (Japanese scientific name, the akou) resembles the gajimaru in appearance and serves the same purpose. The fukugi (Garcinia spicata Hook) and an occasional cycad are common windbreaks. These trees are almost invariably in combination with stone fences, made of blocks, or with fences made of loose stones which have settled and been bound together by small plant roots. Village typhoon protection is a simple but effective combination of stone, shrubs, and trees. There is also an occasional kuroki (kurchi in Okinawan), from whose trunk the samisen, the stringed musical instrument, is made, and the palm (shuro).

[731] [417] [534]

There are wild plants in each of the areas but their importance has also declined. Among these is the pandanus (the adan, Japanese scientific name, the takonoki). This plant was plentiful before the war, but is now scarce except in the mountain area. It can occasionally be seen in genya land or in small clumps on an outcrop. The blades of the pandanus are long and hard, with a row of spines down both sides of the blade. It has had several uses. Formerly it was the common material for making slippers (zori), hats, cigarette cases, and handbags. These home industries have all but disappeared, but old people occasionally do a little. In preparing the pandanus blades for use, the thorns are removed and several strips are made. These are then boiled, dried, and smoothed out. Then they are woven into the desired pattern. A first class pandanus blade is about 5 feet long. In the celebration of O-Bon, the fruit of the pandanus may be offered as food to the ancestors.

[463] [887] [782]

Another plant occasionally used is the getto, known also in Okinawa as sannin or muchigasa. Its chief use is in the festival of the 8th day of the 12th lunar month. At this time, rice cakes (mochi) are wrapped up in its long and wide and flexible fibres. These wrappings, often made by children, are hung from the ceiling or from the wall. The stem of this plant was much used in the past for rope.

824 262 957 The nigana (njana in Okinawan, Ixeris dentata Nakai) is still used in this area as a food and medicine. It has an exceedingly bitter root, about 1/8 of an inch in diameter in a mature plant. The root is put in hot water, and the liquid drunk as a stomach medicine. The leaves, not so bitter as the root, have a sour, slightly bitter taste. They are often served with the white cuttlefish (shiroi-ikka).

The ōbako (known in Okinawan as the hirawakusa or hirawagusa, Plantago Asiatica L, "Japanese ribwort") is used as a medicine and as a food. When vegetables are scarce, it is eaten as a green. As a medicine, the leaf is heated over a fire and the hot leaf is then pressed over a swelling.

The time at which a young man becomes a full fledged fisherman depends on his own ability and progress. Age is not a criterion of skill after a young man has had experience. Perhaps when he is 24, a young man can handle every phase of the work, including catching the swordfish. It is common for a young and an old man to work together, the one as master, the other as novice. There is no stated apprenticeship period. In bad weather, or in rough seas, only the unusually apt young fisherman is allowed to bring in a large fish by himself because of the danger of capsizing.

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Types of Boats

All boats are now motor driven. There are 42 in the village, 41 of which are small skiffs. Three types of boats are distinguished: (1) the hatsudōki. This is little more than a good sized motorboat with a cabin. It carries about 8 men. There is one in the village. The small scale individualized character of fishing here is indicated by the smallness of the remaining craft. (2) the kuribune (literally, "hollowed out boat," from the verb kuru, to carve or to hollow out). Properly speaking, it is a boat carved out of a log, usually of the Japanese redwood (sugi) imported from Japan, but the term is extended to mean any small boat. This type has largely disappeared, and only one remains in the village. The hollowed out boat seems, in this area at least, to have become a lost art. It has been displaced by (3) the hagibune (jointed, pieced together boat). This is also made from the Japanese redwood and is constructed, often by the fishermen themselves, out of planks about 2 1/2 inches thick. There were 40 of these hagibune in January 1952. The number is never constant due to new building, losses at sea, or on shore from typhoon destruction.

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These small boats do not require much maintenance. At typhoon times, they are lifted from the shore up over the breakwater and lashed down on the side of the road. This may not avoid destruction. If the breaking waves are high and strong, they crush the breakwater, hurling its stones against the boats. Every two months, the boats are thoroughly treated by rubbing with shark oil. Cracks and small holes are repaired with small wooden plugs, called fundu in Okinawan. These are shaped like a stylized butterfly. They are inserted in the bottom of the sides of the boats across the running planks, that is, against the grain.

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3

Common Fish and How They Are Caught

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In this area, many different kinds of fish are caught, but the following discussion is limited to the most plentiful and economically

1: Glacken E-5 (1951-1952) 1953 AC7 Okinawa AC7

village volunteer to help if they have the time; each day a group of 5 or more appear, to be replaced the following day by another group until the house is finished. This type of help is more characteristic of the construction or repair of a simple house with a thatched roof than it is with a more expensive and elaborate house which requires specialists.

No days are specifically set aside for community projects, but these are done through co-operative effort. The amount of time given depends on needs as they arise. The care and maintenance of roads and lanes are the most frequent projects. If a road or lane is needed, the village headman and the council discuss the matter, consult the villagers, and the task is then undertaken. Road and lane maintenance includes cutting weeds and clearing away brush to cut down the danger from snakes. These procedures apply also to the construction and care of community owned buildings, such as the village office and the sugar mill. Hanashiro is small enough so that elaborate plans are not required and the desired ends can be accomplished by casual forms of mutual help.

The problems of Minatogawa are different, but the type of co-operation is essentially the same. Because of its situation, typhoon damage is often severe. Cleaning up and repairing after a typhoon is a co-operative enterprise, since there is so much damage to community property such as roads and breakwaters. In the typhoon "Ruth" in 1951, the wind driven waves lashed the breakwater with such violence that the stones were dislodged and scattered over the main road. Repairing typhoon damage is partly a community, partly a family affair. Many of the frailer houses are blown down and must be reconstructed from their foundations. Help in beaching and lashing down boats in anticipation of a typhoon is given by relatives and friends. Road maintenance and construction, village building, the laying of stones around a community water tank or faucet are tasks accomplished by community effort. House-building is done mostly through the co-operation of friends and relatives. There may be visits to Itoman to help members of the extended family there. The ties with Itoman are close.

Matsuda is a larger village whose scattered settlements and community forests have resulted in a more planned community co-operation than exists in the southern villages. Three general forms can be distinguished: (1) officially supervised co-operative work on the roads and in the forests in which every male over school age and the unmarried girls are expected to work a stated number of days in a year. Records are kept of this work. One might regard this as obligatory, but it is more correct to say that it is a universally acknowledged duty requiring no enforcement procedure. (2) Voluntary co-operation in the building of a house, and (3) less formal and more casual help, among relatives and friends in a wide variety of daily tasks, including harvesting, carrying wood, threshing rice, and the like.

In the officially supervised co-operative work, the participating

however, shows much less variation. From the low 50's in early winter it rises to the low 80's in midsummer. The relative humidities, having daily means of 70% in January and February and 82% in July and August, may often reach an uncomfortable 96% preceding or following one of the many rain squalls in the hot season.

From January through March, winds blowing from the northwest to north carry cold, damp air from the Asian continent across the East China Sea. Although many houses in Taira are somewhat protected by bushes separating them from the open valley behind, nevertheless, house doors are often kept shut during this coldest part of the year.

March and April offer a pleasant, balanced climate. Winds are east to southeast, rainfall is low, and temperatures reach the high 60's. The rainy season begins in late May and lasts until late June. During these four weeks it sometimes rains steadily for one or two days, and adults are forced to give up working.

Children take shelter during the worst downpours, but they reappear outside even before the rains are over to play in puddles or little streams running down the streets. During this time floods and landslides occur.

Midsummer is often so hot and humid that villagers frequently comment on their discomfort. This is one of the busiest agricultural seasons, but exhaustion causes many people to take naps during noon hours. Work efficiency decreases, and fewer daily trips are made to the mountains. Children also stay at home in the afternoon. It is believed that the heat causes severe headaches. The hot season gradually gives way to a few weeks in late October, November, and early December which correspond in climate to an early fall in northeastern United States.

Typhoons are known to have hit Okinawa at almost any time of the year. The most dangerous season for these violent storms, however, with wind velocities of over 50 miles per hour, is from late June until October. An extensive warning system exists, and Taira, though remote and without radio, is notified immediately by telephone of storm warnings, sometimes days in advance. Taira people hardly need such warnings. They can sense the oncoming storm and often predict one correctly before the official forecasts confirm that a storm is approaching the island. Since 1955 was one of the rare years in which no major storm hit the island, no firsthand description can be given. The damage is always considerable, not only to crops and trees but also to houses and other property.

625 went out for fugitives from the south, he would accompany the police-
[632] man or investigate himself. In cases of death, both he and the police-
[647] man have to make a report.

[575] The Young People's Association may serve as a vigilante in emer-
[731] gencies such as fires, floods, tornadoes, and other disasters. When a military jeep was reported to have been stolen near Naha and driven on the dead-end road running north, the young people in all villages on the way erected road blocks and were ready to help catch the thief. The group would act together in a similar fashion at any threat from outsiders.

622 The headman can only enforce local ordinances insofar as he is
681 able to persuade people to comply. He is not concerned directly with crime or disturbance of the peace. Exceptions are such matters as steal-
[625] ing sugar cane or letting chickens run loose so that they enter every yard. For such acts, money fines can be imposed. One warden still has a tag which used to be given to the man whose chickens ran around freely. The offender had to pay the fine and keep the tag until he detected someone else's chicken running loose. Then he could pass the
[626] tag on to that person. Such measures are no longer used. But the underlying principle of public censure and fear of ridicule continues to operate in village social control.

623 Public censure is used along with fines to ensure attendance at vil-
626 lage meetings. Roll call is taken before each meeting so that the ab-
[681] sence of individuals is made known to the whole group. Similarly, when tax collections became more and more delinquent, it was decided to have ward meetings in which everybody would be reminded in public to pay his share. Those who were unable to do so would have to state their reasons. As soon as this new plan was announced, several people got up during the meeting to pay outstanding amounts to the head-
872 man. The school uses similar devices to achieve better attendance and scholarship. During home visit week, about once a year, a meeting is held for all parents and the statistics for attendance for each village are read as well as scholastic performances for each community.

INFORMAL CONTROL

156
626 What other people might think is uppermost on everybody's mind.
[867] Children are reminded by their mothers not to play alone lest people would think they are unpopular. They are told not to fight lest others think badly of them or make them responsible for the consequences. Censure by gossip is common, but criticism is seldom made directly to a person's face, and the target of extensive gossip is often unaware of it.